



### Topic: Circular economy

#### Why should companies be interested in circular economy?

Circular economy represents a new alternative to a traditional linear economy based on “take-make-consume-dispose” patterns. The re-circulation of materials in economy helps keep resources in the production process as long as possible and use them to the maximum of their value. Producing with lesser impact on the environment and evaluating the impact of products during their entire life cycles already at their design stage are, however, only the first step.

*“Good product eco-design, innovations and reuse of materials in production can save companies a lot of money. It is what companies should increasingly focus on.”*

**Diana den Held**

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The **Cradle to Cradle** principle motivates companies not only to manufacture less harmful products but also products which improve the environment around us. Although businesses often take the linear direction, there are a large number of companies which are trying to renew, recycle and reuse existing materials or waste in production. The strategist Diana den Held points out that the Cradle to Cradle concept could help European countries make significant savings. “When we are discarding into a waste bin an item that no longer serves us, we hardly ever realize that the material still has some value. The European Union has published statistics which indicate that if the waste we produce in the EU was used in further production, we could save €1.4 billion a year.” Also several companies in Slovakia have already put the principles of circular economy into practice.

For example, U.S. Steel Košice recycles steel because the lifespan of this material is not limited. Kaufland, on the other hand, looks into how to best recover and reuse waste heat from refrigeration equipment in their new facilities. Today they use it for heating and for air-handling and air-conditioning systems. Besides recycling or the optimal use of energy resources, there is another interesting example of how companies can apply the principles of circular economy. Instead of owning products, they can adopt product-sharing schemes where products are shared by several people or companies who are only charged for their use. In some countries people share cars, mobile phones or electromobile batteries this way, and in the Netherlands even jeans.

# Recommendations in the field of Circular Economy

## 1. Treat waste as raw material

The amount of waste in the world has been growing at an immense pace since the Industrial Revolution. The European Union alone annually produces waste worth €2.5 billion. In terms of volume, it is an unbelievable 6 tonnes per capita. At the same time, based on the current population and consumption growth, it is estimated that the global consumption of natural resources will have tripled by 2050, up to 140 billion tonnes a year. It is more than obvious that the currently applied economic model, which is based on the linear “take-make-consume-dispose” principle, is no longer efficient. The reason for this is that it relies on inexhaustible, easily available and easily disposable resources. It has, however, been known for years that the reality is very different. Soil, natural materials or energy sources are precious and limited, and the world is flooded with tonnes of biologically non-degradable waste polluting the surrounding environment. Did you know that users discard up to 80% of products after just six months of use? The main aim that the model of circular economy seeks to achieve is to make the use of all products more efficient and to extend their life cycles. Even waste that commonly ends up at dump sites or in sewerage systems can be turned into a valuable input source. For example, the Slovnaft company collects and recycles used kitchen oil. This vegetable product, often burnt, can be processed into a bio-fuel component which can be added into diesel. Compared to common fossil fuels, such diesel then produces 50–80% less greenhouse emissions. Each business should therefore primarily look beyond waste and find effective solutions to close the loop of the circular economy.

### A BLF example

The textbook example of permanent material used in circular economy is steel. Worldsteel Association estimates that about 75 percent of produced steel is still in use. It is due to the natural properties of steel, mainly the possibility of an infinite number of recycling cycles without quality loss together with simple and economical separation of steel from waste using its magnetic properties. Every steel producer is also a center for steel recycling because steel scrap is a natural part of the process of new steel production. Steelmakers approach to recover by-products of steel products is also important.

The gases produced as an inevitable consequence of processes in blast furnaces and coke oven batteries are used as a secondary source of energy (and therefore substitute production from fossil fuels) – in a number of European factories represent the dominant source of energy (60 percent of the electricity consumed in the **U. S. Steel Košice** (Košice, steel industry) is produced in-house – up to 900 GWh per year). The same applies to slag, a by-product of melting, which is produced from raw materials by separation (e.g. iron from iron ore). The slag is then used for the production of cement or road construction and replaces natural stones. Thanks to this, environmental and energy aspects of stone extraction together with associated costs can be lowered.

### A BLF examples

The **Embraco** company (Spišská Nová Ves, compressors) was awarded a waste disposal “Oscar” for its efficient solutions, which the Golden Ant Award jury described as unique in the Slovak context. One of its most successful projects was the washing of cloths contaminated by hazardous waste – oil emulsions. Another interesting project was municipal waste separation, where the company cooperates with a food provider. The company also recycles dregs from machining processes. The dregs are used in the production of heating pellets.

By joining the Healthy Seas Initiative, **Kaufland** (Bratislava, retail chain) has voluntarily committed itself to protecting seas and the world’s fish reserves. As the first retail chain in Europe, it sells socks made from recycled fishing nets which have been pulled out of the sea thanks to the Healthy Seas Initiative. The nets contribute to the pollution of seas and oceans and represent a mortal danger to sea animals such as fish, dolphins, turtles, or sea birds.

## 2. Use energy from renewable resources and optimize its use

Today's world offers a lot of possibilities to reconsider and improve how we make things. "Re-Thinking Progress" reveals a new model of economy based on products which are "made to be made again" while using energy from renewable sources. Renewable sources contribute to achieving energetic self-sufficiency, reducing dependence on natural gas supplies and fossil fuels in general, creating new jobs in the region and, last but not least, to positively influencing the environment by reducing the production of carbon dioxide emissions.

### A BLF example

**Kaufland** (Bratislava, retail chain) uses recuperation technology for heating and cooling instead of conventional heating units. Industrial cooling technology includes integrated heat exchangers and heat pumps that convert waste heat into usable energy, which fully covers the needs of heat for heating the building in winter and refrigeration demand for cooling the building in summer. This technology significantly improves energy efficiency and reduces the emissions of greenhouse gases.

### A BLF example

Renewable energy sources are part of the solutions that the **Veolia Energia** company (Bratislava, Vrábľe, Žiar nad Hronom and several small towns in eastern Slovakia) developed in order to increase the energetic and environmental efficiency of its thermal technical equipment. With regard to development activities, biomass projects are one of the company's priorities. Biomass has the greatest technologically usable potential of all renewable energy sources in Slovakia; therefore, Veolia Energia's technological solutions mostly focus on its use. The company started burning biomass in 2004. At present, biomass is used for heat and hot water production at the housing estate of Lúky in the town of Vrábľe, at the housing estate of Západ in Poprad and Žiar nad Hronom in the combined production of electricity and heat using advanced gasification technology. In the east of Slovakia, Veolia Energia operates 14 biomass boiler rooms burning wood chips and sawdust. Wood chips and sawdust come from wood leftovers, cuttings, thinning, from the company's own production of fast growing trees and from damaged wood.

## 3. Design products so that harmless materials can be recycled in production

The aim should be to design products which will not pose any risk and whose presence (in buildings, offices, households, etc.) will not do any harm to health. It does not suffice to dispose of unhealthy products because their subsequent recycling will result in the production of further toxic products. Most existing products do not have to be correctly optimized for recycling yet. Therefore, material methodology is crucial. There are still a lot of substances which cause cancer, hormonal and other disorders and which are adverse to the environment, plants and animals. There are also substances which are not very healthy, but with which we will never have contact. For example, glass contains certain substances with which we never have any contact and which, as a result, cannot harm us. Each substance found in a product can be categorized according to risk; the assessment then includes a so-called matrix. It contains complete information about what a product is composed of, which of its ingredients should not be recycled and which, on the contrary, are suitable for recycling.

### Example

**Fairphone** produces ethical and easily repairable smartphones which are made from ethically sourced and recycled mineral resources and materials. The engineers who developed Fairphone did not think only of the materials, but also of the phone's entire life cycle with a view to minimizing its impact on the planet and the humanity. The production of the new smartphone does not require minerals from conflict countries, the device is fully recyclable, and the rights of the workers who produce it are not violated. The manufacturer invests 3 euros of the sale of each Fairphone into recycling projects in countries where waste is not separated yet.

## 4. Design products as material banks

Instead of using materials and producing waste only, we should develop a strategy for the management of their circulation. When manufacturing products, we should know in advance where the materials will end and how they will be reused. We should regard all products as material banks, which means we should put the materials aside for some time, and when the product dies, the collected materials should be sent for reuse. It is important to note that this can only be done if the products (buildings, boats, etc.) have been designed for such a purpose. The concept of "Materials Passports" makes it clear where in the product which materials can be found.

While designing a product, we should take into account how easily the materials can be extracted from the product and how much energy the extraction requires. The whole process should be as fast and as simple as possible – if a product is well-designed, the extraction of materials for recycling will be less costly and more effective.

### Example

The large ship-making **Maersk company** also manufactures their cargo vessels using the "design to assembly" method. They assume that there will be a shortage of steel and other essential materials on the market in thirty years' time, and this way they can control the supply of the essential raw materials. The company supplies its products with the so-called Cradle-to-Cradle passport, which contains information about the material composition of each part of a vessel and the estimated lifespan of the materials. The company can thus better recycle up to 95 per cent of all parts.

### Examples

The **Philips Econova** LED television is made from recycled material and is easy to be recycled again. It is made without the use of PVC, bromine flame retardants and other hazardous substances. The packaging does not contain polystyrene and is one hundred per cent recyclable.

**Herman Miller** was one of the first companies to have started designing their products using the "Materials Passport" method. It came up with an idea of chairs dismantlable into individual materials within 15 minutes. The materials can be subsequently recycled and used for the production of new parts.

## 5. A product should be of benefit both to people and the environment

The question of the protection of consumers have been brought to the fore. The European Union more vehemently appeals for the elimination of toxic chemicals from the production and supports investments into production processes which do not pollute the environment. New rules that require lifelong access to products which will be more easily recyclable and repairable and which will have a longer lifespan should be applicable to all product groups. Particularly valuable can be products which, besides their basic functionality, have an unexpected health benefit for the user.

### Example

There are a lot of examples based on the principle of circular economy abroad. For example, the **AkzoNobel** company has made paint which cleanses the air. It is a product which is not detrimental to health and the environment. It contains bacteria which transform formaldehyde and thus improve the air indoors.

### Example

The **Desso** company produces carpets which absorb dust and thus help people with asthma. In addition to this, Desso started cooperating with Philips and made light-transmitting carpets, which are nowadays tested at airports and facilitate spatial navigation. If a gate changes at the airport, the floor changes into a signpost which will show passengers where to go. The carpets work similarly at hotels. Small signposts show guests the way to the bathroom at night.

## Did you know that...?

- More and more companies are assuming responsibility for their products and production methods. If companies are responsible, they will follow this trend. They will thus ensure a market share and a competitive advantage for themselves. If they do not do so, it might have an adverse effect on their business 5 to 10 years from now.
- Safe and healthy buildings, which produce energy from renewable resources and purify water, save costs for the people who live or work in them, as well as create an inspiring environment. This attracts young motivated and educated experts and gives the companies and also the towns or cities a competitive advantage over others. It also attracts investments in the region because the companies need qualified staff and these staff want to work for companies which do business responsibly.

Source:

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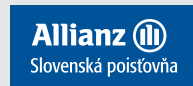
## In conclusion

Let us repair, renew, share, recycle and reuse all existing products or materials. Let us try to use natural resources more efficiently, and let us create job opportunities for innovators. The application of the principles of circular economy can ensure long-term growth to our companies. According to the European Commission's information, better product eco-design, prevention of waste creation, or reuse of materials in production can save European companies up to €600 billion. Increasing the efficiency of the use of resources by 30% could help countries increase their GDP by 1% by 2030 and create two million new jobs. The European Commission's "Europe 2020 Strategy" also suggests increasing the recycling of municipal waste to 70% and the recycling of plastics to 80% by 2030, which should lead to a 40% reduction in the emissions of greenhouse gases from waste. The countries which do recycling have a better climate footprint.

The principles of circular economy can be implemented in all industries no matter if you produce nappies, build houses, manage clients' bank accounts, or sell food or electricity. Here are several inspiring examples. The Dell company as one of the first manufacturers of electronics started reinforcing shipping boxes for servers with materials made from mushrooms. The quality of this packaging is not only comparable to that of commonly used plastics, but it can also be easily composted in a garden. The Adidas company, on the other hand, cooperates with the Parley for the Ocean organization and helps eliminate dangerous plastics from our water resources by producing trainers from oceanic waste. Did you know that making the font in your reports or projects smaller can help save large areas of forest? As much as 15 million hectares of forest disappear worldwide every year, and one third of these trees fell victim to the process of paper production. The Samsung company is aware of this serious problem and, as a result, came up with a project titled "Minus One", which helps reduce the use of office paper by as much as 20 billion sheets a year by reducing the font by one point. And this is not by far everything. What about taking things a step further and producing paper which can stop forests from disappearing? The Prairie Paper company implements a project "Step Forward Paper" and makes office paper composed of 80% wheat waste, which is freely available and otherwise mostly destroyed after the harvest. Each material can be given a second chance. It is what the large clothes-maker H&M knows a lot about – it makes new clothes from old clothes collected from customers.

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